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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/966,740      | 10/01/2001  | Keiiti Ogura         | 12732-077001/US5246 | 3604             |

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EXAMINER

DONG, DALEI

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2875

DATE MAILED: 03/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/966,740

Applicant(s)

OGURA ET AL.

Examiner

Dalei Dong

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 March 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) 50-55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/966,740.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities:

On page 3, line 9, "de3notes" should be "denotes".

On page 3, line 10, cathode designation numeral should be 1604 and not "1698".

Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-17 and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,990,615 to Sakaguchi in view of U.S. Patent No. 5,962,962 to Fujita.

Regarding to claims 1-17 and 23-26, Sakaguchi discloses in Figure 1, an organic EL element comprising "a transparent anode layer 2 of indium tin oxide (ITO) is formed on a glass substrate 1 by using a sputtering method, and a hole injection-transport layer 3, a light emission layer 4, an electron transport layer 6 and a cathode 7 are subsequently formed on the anode layer 2 by using vacuum deposition method" (column 2, line 35-40).

Sakaguchi also discloses in Figure 1, "an insulative protective layer 8 for the organic EL element, oxide insulator such as SiO<sub>2</sub>, MgO or Al<sub>2</sub>O<sub>3</sub> is deposited on the

cathode 7 by a vacuum deposition method with a thickness of 10 nm to 100 nm so as to cover all of upper surface of the cathode and side surfaces of its laminated body including from the hole-injection-transport layer 3 to the cathode 7" (column 2, line 41-47).

Sakaguchi further discloses in Figure 1, "as a method of sealing the thus prepared EL element body, a sealing member 9 having a cap structure is provided at the peripheral portion of the element, an an inert liquid 12 comprising a fluorocarbon such as perfluoroalkane or perfluoroamine with which a dehydrating agent 10 and/or an oxygen absorber 11 is/are mixed is filled therein. The sealing member can be made of metal or glass" (column 3, line 9-15).

However, Sakaguchi does not disclose the absorption film is a hygroscopic film. Fujita teaches, "a protective layer is formed on the periphery of a device having the above layer structure to cover the device, for preventing the infiltration of water into the device" (column 12, line 3-6).

Fujita also teaches "specific examples of the material for the protective layer include a copolymer obtained by copolymerizing a monomer mixture containing tetrafluoroethylene and at least one comonomer, a fluorine-containing copolymer of which the copolymer main chain contains a cyclic structure, polyethylene, polypropylene, polymethyl methacrylate, polyimide, polyurea, polytetrafluoroethylene, polychlorotrifluoroethylene, polydichlorodifluoroethylene, a copolymer from chlorotrifluoroethylene and dichlorodifluoroethylene, a water-absorption substance having a water absorption ratio of at least 1%, a humidity-preventive substance having a water absorption ratio of 0.1% or less, metals such as In, Sn, Pb, Au, Cu, Ag, Al, Ti and

Ni, metal oxides such as MgO, SiO, SiO.sub.2, Al.sub.2 O.sub.3, GeO, NiO, CaO, BaO, Fe.sub.2 O.sub.3, Y.sub.2 O.sub.3 and TiO.sub.2, and metal fluorides such as MgF.sub.2, LiF, AlF.sub.3 and CaF.sub.2" (column 13, line 63-67 to column 14, line 1-11).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the protection layer of Fujita for the organic EL element of Sakaguchi in order to eliminate and prevent the moisture and undesired gas from infiltrating the light-emitting element and reduce the formation of black spot and thus prevent the oxidation by absorb the moisture within the device and furthermore prolong the lifetime of the device.

4. Claims 18-22 and 42-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,684,365 to Tang in view of U.S. Patent No. 5,962,962 to Fujita.

Regarding to claims 18-22 and 42-49, Tang discloses in Figures 2 and 3, the construction of the electroluminescent device comprising an substrate of this device is an insulating and preferably transparent material such as quartz or a low temperature TFT1 is the logic transistor with the source bus (column electrode) as the data line and the gate bus (row electrode) as the gate line. TFT2 is the EL power transistor in series with the EL element. The gate line of TFT2 is connected to the drain of TFT1. The storage capacitor is in series with TFT1. The anode of the EL element is connected to the drain of TFT2.

Tang also discloses "in another embodiment, the EL cathode is a bilayer composed of a lower layer of a low work function metal adjacent to the organic electron

injecting and transporting zone and, overlying the low work function metal, a protecting layer that protects the low work function metal from oxygen and humidity. Optionally, a passivation layer may be applied over the EL cathode layer" (column 10, line 8-14).

However, Tang does not disclose the absorption film is a hygroscopic film. Fujita teaches, "a protective layer is formed on the periphery of a device having the above layer structure to cover the device, for preventing the infiltration of water into the device" (column 12, line 3-6).

Fujita also teaches "specific examples of the material for the protective layer include a copolymer obtained by copolymerizing a monomer mixture containing tetrafluoroethylene and at least one comonomer, a fluorine-containing copolymer of which the copolymer main chain contains a cyclic structure, polyethylene, polypropylene, polymethyl methacrylate, polyimide, polyurea, polytetrafluoroethylene, polychlorotrifluoroethylene, polydichlorodifluoroethylene, a copolymer from chlorotrifluoroethylene and dichlorodifluoroethylene, a water-absorption substance having a water absorption ratio of at least 1% a humidity absorption ratio of at least 1% water absorption ratio of 0.1% or less, metals such as In, Sn, Pb, Au, Cu, Ag, Al, Ti and Ni, metal oxides such as MgO, SiO, SiO.sub.2, Al.sub.2 O.sub.3, GeO, NiO, CaO, BaO, Fe.sub.2 O.sub.3, Y.sub.2 O.sub.3 and TiO.sub.2, and metal fluorides such as MgF.sub.2, LiF, AlF.sub.3 and CaF.sub.2" (column 13, line 63-67 to column 14, line 1-11).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the protection layer of Fujita for the organic EL element of Tang in order to eliminate and prevent the moisture and undesired gas from

infiltrating the light-emitting element and reduce the formation of black spot and thus prevent the oxidation by absorb the moisture within the device and furthermore prolong the lifetime of the device.

5. Claims 27-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,990,615 to Sakaguchi in view of U.S. Patent No. 5,962,962 to Fujita in further view of U.S. Patent No. 6,195,142 to Gytoku.

Regarding to claims 27-33 and 36-41, Sakaguchi discloses a first substrate; an EL element comprising an organic light emitting layer formed over the first substrate; however, Sakaguchi fails to disclose a barrier film covering the EL element and an inorganic hygroscopic film formed over the barrier film.

Fujita teaches a inorganic hygroscopic film formed over the EL element, however fails to teach a barrier film covering the EL element. Gytoku teaches in Figure 1, "the organic electroluminescence element is composed of a laminate structure formed of a substrate 1, an anode 2 disposed on the top surface of substrate 1, an organic thin film layer 3 disposed on the substrate 1 and anode 2, a cathode 6 disposed on the top surface of the organic thin film layer 3, and a protective layer 7 (barrier film) disposed to cover the cathode 6 and organic thin film layer 3, and a shield material 8 disposed on the surface of the substrate to cover the outer surface of the laminate structure. In particular, the shield material 8 and substrate 1 are adhered through an adhesive layer 9" (column 5, line 61-67 to column 6, line 1-4).

Gyotoku also teaches, "as the protective layer 7, an insulating compound layer is used, for example, GeO, SiO, SiO.sub.2, MoO.sub.3, other oxide, AlN, Si.sub.3 N.sub.4, other nitride, PET, or other thermoplastic organic high polymer, and GeO is particularly preferred.

Gyotoku further teaches, "the reliability may be further enhanced by controlling the film thickness of the insulating compound layer as the protective layer 7, in particular, by laminating a metal conductive film on the protective layer 7" (column 8, line 39-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have disposed the barrier film of Gyotoku on the cathode of the organic EL element of Sakaguchi and utilize the protection layer of Fujita for the organic EL element of Sakaguchi in order to eliminate and prevent the moisture and undesired gas from infiltrating the light-emitting element and reduce the formation of black spot and thus prevent the oxidation by absorb the moisture within the device and furthermore prolong the lifetime of the device.

Regarding to claims 34 and 35, Sakaguchi discloses a protective insulating layer for the organic EL element. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have dispose a layer of the protective insulating layer of Sakaguchi on the second substrate or casing of the organic EL element of Sakaguchi in order to prevent the moisture and undesired gas from infiltrating the light-emitting element and reduce the formation of black spot and thus prevent the oxidation.



by absorb the moisture within the device and furthermore prolong the lifetime of the device.

*Conclusion*

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art are cited to further show the state of the art of composition of a organic EL element.

U.S. Patent No. 5,909,081 to Eida.

U.S. Patent No. 5,990,629 to Yamada.

U.S. Patent No. 6,121,726 to Codama.

U.S. Patent No. 6,160,346 to Vleggaar.

U.S. Patent No. 6,172,459 to Hung.

U.S. Patent No. 6,198,217 to Suzuki.

U.S. Patent No. 6,525,330 to Matsumoto.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone numbers for the

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organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.  
March 11, 2003

  
Sandra O'Shea  
Supervisory Patent Examiner  
Technology Center 2800